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blers now before me, 11 show the chestnut stripe on the sides; in 6 of these, however, it is only faintly indicated. One of the 40 has the yellow crown of the adult; all have the wing-bands strongly tinged with sulphur yellow, and almost all are bright olive green above.

The first arrival for the fall of 1890 was September 21.

16. *Dendroica æstiva*.—I have before me 32 males and 15 female Yellow Warblers, including specimens from both the Atlantic and Pacific sides of the country, but the majority are from the vicinity of San José. I believe all are true *æstiva*, although the difference between birds from the extremes of the series is very great. Eight of the 32 males have the chest and sides more or less streaked with chestnut. From a bird thickly marked with rather broad reddish chestnut streaks there is a gradual variation, the streaks becoming fewer, narrower, and lighter until just discernible. The yellow of the under parts also grows appreciably paler; only 4 of the 18 show faint chestnut streaking on the back. Above yellowish olive green; some of those that are brighter colored below have the crown more or less ochraceous orange, but this color gradually darkens into the yellowish olive green of the back. In the remaining 14 males, those in which the chestnut streaks are almost entirely obsolete, the yellow of the underparts grows fainter and varies from gamboge yellow to clear straw yellow. Above there is no sign of streaks and the yellowish color gradually disappears giving place to dusky grayish, until the last which I would describe as dusky grayish olive green.

The 15 female examples show the same variations as noted in the males, only the brightest female is not as bright as the brightest male, and at the other end of the series they are duller above and somewhat paler below.

The first arrivals the present year were noted August 24.

(To be continued.)

THE SCOTERS (*OIDEZIA AMERICANA*, *O. DEGLANDI* AND *O. PERSPICILLATA*) IN NEW ENGLAND.

BY GEORGE H. MACKAY.

My experience on the coast of New England has shown that observations covering a series of years are necessary in order to arrive at any important conclusions respecting the habits and movements of the water birds during their passage along this

coast, as the amount of information collected each year is small and the observations of different years often contradictory, owing to the varying conditions of the weather which govern in a large measure the movements of these birds during migration. In order to obtain a knowledge of the waterfowl, investigation must be prosecuted during the colder months, when inclement weather is likely to prevail; besides one must be a good boatman; hence the conditions for the observations as a rule are not so favorable nor so agreeable as the prosecution of similar investigations respecting land birds.

It is for these reasons that I venture to present in the following pages the results of such observations as I have been able to make, concerning the habits, feeding grounds, and migration of the three species (known under the common name of Coot) designated in the above title, with the hope that they may prove of interest.

These Scoters are the most numerous of all the sea fowl which frequent the New England coast, collecting in greater or less numbers wherever their favorite food can be procured, — the black mussel (*Modiola modiolus*), small sea clams (*Spisula solidissima*), scallops (*Pecten concentricus*), and short razor-shells (*Siliqua costata*), about an inch to an inch and a half long, which they obtain by diving. As an indication of how large a scallop these Ducks can swallow, I may mention one taken from the throat of an adult male White-winged Scoter, which was about the size of a silver dollar; it cut the skin of the neck when the bird struck the beach after being shot. Mussels measuring two and half inches by one inch have been taken from them; but usually they select sea clams and scallops varying in size from a five cent nickel piece to a quarter of a dollar. They can feed in about forty feet of water, but prefer less than half of that depth. As these mussels are frequently difficult to detach, and the sea clam lives imbedded endwise in sand at the bottom with only about half an inch above the sand, the birds are not always successful in obtaining them, it requiring considerable effort on their part to pull the mussels off, or to drag out the clams. Eight or ten of these constitute a meal, but the number varies according to the size. I have heard of a mussel closing on a Scoter's tongue, which was nearly severed at the time the bird was shot (Muskeget Island, about 1854). The fisherman frequently discover beds of shell fish (scallops) by noticing where these birds con-

gregate to feed. In the shoal waters adjacent to Cape Cod, Nantucket, and Marthas Vineyard, these mollusks are particularly abundant, and consequently we find more of the Scoters in those localities than on any other part of the coast or perhaps than on all the rest of the coast combined. The birds living north of Chatham, Cape Cod, are found in widely scattered groups. Among the places frequented by the larger bodies further south are Point Kill Pond Bar, three miles off Dennis; the flats off Chatham, Mass. (twelve feet of water, and sea clams); Cape Cod, Mass.; Nantucket Shoals; Horse Shoe Shoal; Muskeget Channel; Vineyard Sound off Gay Head; and the whole north shore of Nantucket Island, about two or three miles out from the island. Most of these places being inaccessible to ordinary sportsmen, the birds can live undisturbed during the late autumn, winter, and spring months; undoubtedly returning year after year to these same waters, which appear to have become their winter home.

Where there are large ponds adjacent to the coast, separated from the ocean by a strip of beach, all three of the Scoters will at times frequent them to feed, and will collect in considerable numbers if the supply of food is abundant; in which case they are very unwilling to leave such ponds, and, although much harassed by being shot at and driven out, continue to return until many are killed. An instance of this kind occurred the first of November, 1890, when some four hundred Scoters collected in the Hummuck Pond on Nantucket Island; they were composed entirely of the *young* of the Surf and White-winged Scoters, only one American (a female) being obtained out of about fifty birds shot in one day (Nov. 3) by a friend and myself. I shot three American Scoters on Nov. 2 in the same pond.

As early as the 10th of August White-winged Scoters begin to arrive on this coast from the North, a good many of which have their breast feathers thin and worn off. The young White-wings do not arrive much before the 8th to the 14th of October. A few of the *old* American Scoters appear early in September, a large movement usually taking place from the 17th to the 25th of September; a few of the young birds arrive about the eighth of October. The old birds of the Surf Scoter appear about the middle of September, with a very large movement about the 20th, accor-

ding to the weather, the young birds making their appearance the last of September or first of October. I have known a considerable flight to occur on the last day of September, the wind all day being very fresh from the southwest, which deflected them in towards the land ; such an early movement is, however, unusual. An easterly storm about the middle of August is likely to bring them along, the wind from this direction being particularly favorable for migration ; if, on the other hand, the weather is mild and warm, it is not usual to see them so early.

From this time on they continue to pass along the coast until near the end of December, the main flight coming between the 8th and 20th of October, depending upon the weather, when the migration appears to be at an end. During such migration they are estimated to fly at a rate of about one hundred miles an hour, but this rate is also governed by the weather. The greater part of these Scoters pass around Cape Cod, as I have never heard of, nor seen, any of the immense bodies of 'bedded' fowl north or east of it as occur south and west of the Cape ; probably because they are unable to find either the security or profusion of food north of it, that they can obtain in the waters to the south. They therefore congregate here in large numbers. On March 18, 1875, I saw on a return shooting trip from the island of Muskeget to Nantucket a body of Scoters, comprising the three varieties, which my three companions and myself estimated to contain twenty five thousand birds.

In these shallow waters the tide runs rapidly over the shoal ground and sweeps the Scoters away from where they wish to feed, thus necessitating their flying back again to it ; consequently there is at such times a continual movement among them as they are feeding. When wounded and closely pursued, they will frequently dive to the bottom (always using their wings as well as feet at such times in swimming under water) and retain hold of the rockweed with the bill until drowned, preferring thus to die than to come to the surface to be captured. As an instance of this, I may mention that on one occasion I shot a Scoter when the water was so still that there was not even a ripple on its surface ; after pursuing the bird for some time I drove it near the shore, when it dove and did not reappear. I knew it must have gone to the bottom, as I had seen the same thing repeatedly before. As the occasion was a favorable one for investigation, the water being

clear and not more than twelve or fifteen feet in depth, I rowed along carefully, looking continually into the water near the spot where the bird was last seen. My search was at last successful, for on getting directly over where the bird was I could look down and distinctly see it holding on to the rockweed at the bottom with its bill. After observing it for a time I took one of my oars, and aiming it at the bird sent it down. I soon dislodged it, still alive, and captured it. I have often seen these birds, when wounded and hard pressed, dive where the water was forty to fifty feet deep, and not come to the surface again. I therefore feel much confidence in stating that it is no uncommon occurrence for them under such circumstances to prefer death by drowning to capture. This they accomplish by seizing hold of the rockweed at the bottom, holding on even after life has become extinct. I have also seen all three species when wounded dive from the air, entering the water without any splash. All are expert divers, it requiring considerable experience to retrieve them when wounded.

I have noticed during the spring migration northward in April that frequently the larger flocks of the Surf Scoter are led by an old drake. That the selection of such a leader is a wise precaution has frequently been brought to my notice, for on first perceiving such a flock coming towards me in the distance, they would be flying close to the water; as they neared the line of boats, although still a considerable distance away, the old drake would become suspicious and commence to rise higher and higher, the flock following him, until the line of boats is passed, when the flock again descends to the water. When over the boats shots are frequently fired up at them, but so well has the distance been calculated that it is seldom a bird is shot from the flock.

While each species, during spring migration, prefers to keep separate from the others, I have at times noticed flocks which had a few stragglers of the other kinds mixed with them, and have seen stray birds join flocks not of their own kind. They, however, soon appeared ill at ease, frequently leaving the flock before passing from view.

All three varieties when flying directly overhead at an elevation of about one hundred and thirty yards, can be called or whistled (by blowing through the fingers placed in the mouth) down to within ten or fifteen yards of the water, though *never* into it; but it requires one whose eyes and hands work in most perfect accord

to catch them with a charge of shot during such a headlong, zig-zag rush. I explain this action on their part by the supposition that at first they mistake the sound for the noise of a hawk's wings and seek the water for safety. I have seen the same result produced by a rifle ball passing through or near a flock flying high in the air. Either of the Scoters, when at considerable distance, can be attracted towards the decoys by shaking a jacket or hat at intervals, which, when their attention has been secured, should be stopped; for once their eyes have become fixed on the decoys, they will usually come to them, if flying low down near to the water.

My experience shows that all the Scoters are unusually silent, and seem to depend entirely on their sight, in discovering their companions. The American Scoter makes a musical whistle of one prolonged note, and it can frequently be called to the decoys by imitating the note. I have rarely heard the Surf Scoter make any sound, and then only a low guttural croak, like the clucking of a hen; they are said to utter also a low whistle. The White-winged Scoter, so far as I know, is perfectly silent, although I have heard that they make a low quack, like the note of the Blue-winged Teal; yet they can be called to the decoys in the spring by making a loud purring sound, like the call of the Brant.

In the spring mating begins before the northward migration commences, as I have taken eggs from females, between the 15th and 25th of April, which varied in size from a cherry stone to a robin's egg. During this period the duck when flying is always closely followed by the drake, and wherever she goes, he follows; if she is shot, he continues to return to the spot until also killed. I have often on firing at a flock shot out a female; the moment she commences to fall, she is followed by her mate; he remains with her, or flies off a short distance only to return again and again until killed, regardless of previous shots fired at him. I have never seen any such devotion on the part of the female; she always uses the utmost speed in flying away from the spot, and never returns to it.

In regard to the abundance of each kind of Scoter, it is difficult to judge, but I lean to the opinion that the Surf Scoter is the most numerous; next, the White-winged, and lastly the American. I think there is little difference as to the numbers now, and formerly; but during the southern migration, unless it

is thick and stormy weather, they pass farther out from land than formerly, owing to their being shot at. When migrating they fly very much higher in calm than during windy weather, and if there is any difference in the elevation of their flights at such time, I should say the Surf Scoter flew the highest (with the exception of those White-winged Scoters which migrate *west* in May).

I do not think it is generally known, or has been before stated, though I have known the fact for twenty years, that a very large number of the *White-winged* Scoters which make their winter home in the waters adjacent to Cape Cod, Nantucket, and Muskeget Islands regularly make a migration in May to the *westward* as far as Noank, Connecticut, where I have ascertained they are found during the latter part of May. They fly in the evening and at night, very high up, in a due *northwest direction*, usually passing in moderate muggy weather, making a low guttural sound at intervals. As I cannot obtain any data of their occurring west of this point on Long Island Sound, I venture to suggest that they pass high up over the state of Connecticut during the *night* and reach their breeding grounds at the north by the Connecticut River and Lake Champlain or Hudson River routes. This movement is a peculiar one, inasmuch as it takes place about the middle of May, and after the greater portion of the migration of this group has passed by, as also in ignoring the coast route accepted by all the rest. My attention was first directed to this unusual movement during the spring of 1870, while shooting at West Island, off Seconnet Point, Rhode Island, and it has occurred regularly every year since that date, as was undoubtedly the case earlier. These birds are apparently all adults, and do not seem to heed the regular migration to the eastward of many of their own kind, which has no effect in hastening their departure for the north. When the time arrives for them to set out on their migration, and the meteorological conditions are favorable—for it must be clear at the westward—they always start late in the afternoon, from *three to five* o'clock, and continue the flight during the night, passing by Marthas Vineyard, Woods Holl, Seconnet Point, Point Judith, and Watch Hill, quite a number frequently going over the land near the coast, they being very erratic at such times in their movements. This flight lasts for from three to seven days, according to the state of the weather. I have never

heard of their starting before the 7th of May, which is unusually early; the customary time being from the 12th to the 15th, and the latest the 25th. They usually fly at a considerable altitude, say from two hundred to three hundred yards, fully two thirds of them being too high to shoot. They prefer to start during calm warm weather, with light southerly, southeasterly, or easterly winds; though they will occasionally fly when the wind is strong. They never fly in the forenoon, but when once they have determined to migrate, they leave in large flocks, some of which number from five to six hundred birds, while as many as ten thousand have been estimated as passing in a single day. I have never heard of, or seen any similar flight to the *eastward* after this *western* flight has taken place. A few of the other two Scoters are seen with the White-wings during this western movement. No perceptible difference is noted in their numbers from year to year, and I have never heard of a year when such a flight as above described did *not* take place.

The cause of this late and unusual movement is undoubtedly the breaking up of the large bodies of White-winged Scoters which have been living all winter between Cape Cod and Muskeget and Marthas Vineyard Islands; and I feel moderately certain that these birds return year after year to their old haunts, it having become after so long an occupation as much their winter home as the one at the North has their summer home. They consequently prolong their stay until the last moment. As before stated, they are apparently all old birds, exceedingly large and heavy; they are so densely feathered, powerful, and tenacious of life, that at the long distances one has to shoot at them, the shot will not penetrate unless they are hit in the head or neck. To recover a wing-broken one, if otherwise uninjured, is most difficult, in which respect they stand on a parity with the Loons and Eiders.

Towards the latter part of May there is a movement of Surf and American Scoters to the eastward, the flight being up Buzzards Bay and crossing high up over the land to Cape Cod Bay. There is also a movement south, during the latter part of October, over Barnstable County near Centerville, Mass., from Cape Cod Bay to Vineyard Sound.

I am informed on very good authority that when the *western* migration of the White-winged Scoter is taking place in May,

many Surf Scoters pass *east* through Vineyard Sound, say three or four flocks of from fifty to seventy-five birds each during an hour. On their way north in April, the Surf and American Scoters usually make their appearance before the White-wings. The migration of the Scoters is so mixed that I have rarely separated the entries in my earlier notes (much to my regret now). I can therefore only give data in most instances of the combined migration. In order that some idea may be formed as to the time when these defined movements occur, I copy the following from my notes. My place of observation in the spring was Seconnet Point, Rhode Island; in the autumn at Straitsmouth Island, Cape Ann, Mass.

1862, Oct. 11. Large flight of Scoters going south.

1862, Oct. 12. Quite a movement going south.

1862, Oct. 14. An enormous flight of Scoters going south; wind east, blowing hard; shot a great many, lost some, but saved fifty and one Canada Goose.

1862, Oct. 15. A flight going south.

1865, Oct. 13. Large flight going south; blowing very hard from the south.

1866, Sept. 25. A small number going south; wind S. E. with fog and rain.

1866, Sept. 29. Quite a number of *old* Scoters flying south, far out from shore; weather very calm.

1866, Oct. 1. A small movement of *old* American and Surf Scoters going south; wind blowing hard before daylight, but moderated at that time.

1866, Oct. 2. Shot Blue-bill Widgeon in company with Scoters.

1866, Oct. 6. Some Scoters flying; wind N. W., cold.

1866, Oct. 9. Quite a flight of Scoters in the morning; blowing hard from the east.

1866, Oct. 10. A large flight going south with wind east, moderate; mostly White-wings; first flight of them seen this year. Birds flying high.

1866, Oct. 11. The Scoters all flying high again today, weather very moderate, wind southeast. Scarcely any birds after 10 A.M.

1867, Oct. 8. Considerable flight of White-wings going south; wind northwest in the morning; died away, and went around the compass to west about noon. Two Red-head Ducks (*Aythya americana*) shot today.

1869, April 25-26. Quite a movement to the eastward, mostly White-wings and Surf Scoters; also a few American Scoters.

1870, April 26. Large flight of the three varieties of Scoters eastward; the best day this spring; wind S. W., moderate, warm, fine weather.

1875, April 24-27. A flight towards the eastward, wind S. W., moderate.

1877, April 17. An *enormous* flight to the eastward; wind S. E., raining and blowing hard.

1878, April 10. First flight of Scoters to the eastward. April 14-16. Wind northwest in the morning, calm in the afternoon. A good many Scoters flew wide off shore. Wind fresh N. and N. W., later S. W. light. On the 16th wind N. E. light.

1878, April 17. A *great* many Scoters going east, wind light N. E. Birds all flew during morning, none in afternoon.

1878, April 19-20. A *great flight*, mostly Surf and American Scoters, wind S. W.—on the 20th wind light S. E. Birds all flying to the eastward—fine weather.

1878, April 30. Quite a movement, wind N. E. with rain.

1879, April 20-21. Previous week very stormy, with wind and *snow*, it cleared on the 20th and considerable many Scoters flew, a large share of which were from the eastward. No flight towards the east has as yet taken place; the season is over two weeks later than last year.

1879, April 22. Many Scoters; wind S. W. in the afternoon, gentle.

1879, April 24. Many Scoters flying westward, many more than to the eastward; wind N. W., light early. Scoters stopped flying at 9.30 A.M.

1879, April 25. A good many Scoters commenced flying at 11 A.M., wind S. E. and E. No birds moving in the morning, when it was calm.

1879, April 27. Quite a number of Scoters going east, commencing to fly at noon with the wind. It was N. E. early and calm. No defined flight up to the 29th.

1880, April 9. No movement of Scoters up to date.

1881, April 16. A good many Scoters flying east, clear and cool, wind west.

1881, April 16. No special movement this spring until today; weather of past ten days very cold and stormy, snowing on the afternoon of the 15th, wind northeast; season two weeks late.

1881, April 21. A good many Scoters flying east; wind west by south and southwest. It was foggy, early and calm, no birds; cleared later and Scoters commenced to move.

1881, April 22. A good many Scoters going east, wind N. E.; no defined flight this spring before today, which is only a moderate movement.

1884, April 11. First ten days of this month very stormy, with rain and some snow. Northerly and northwesterly winds most of the time. On the 11th wind came southwest at noon, and quite a number of Scoters flew to the east.

1884, April 12. A good many Scoters flying eastward up to 9.30 A.M.; wind light, northwest, almost calm. At 9.30 A.M. wind changed to S.W. fresh, and birds stopped flying on this change.

1884, April 13. Not so many Scoters flying as yesterday, but still quite a movement to the eastward; wind south, nearly calm,

1884, April 15. Quite a flight from the westward; wind S. E., increasing.

1884, April 16. The largest flight this spring up to date.

1884, April 24. A good many Scoters, weather calm.

“ “ 27. A good many Scoters.

“ “ 28. A great many Scoters, but flying far out from shore.

1884, April 29. A good many Scoters today; think about all the birds have passed.

1886, April 8. First movement of Scoters going east; this is the earliest movement I have ever known. Weather moderate, wind S. and S. W.

1886, April 11-12. Quite a flight to the eastward, wind S. and S. W. moderate, but no *large* movement up to the 20th. On 15th, saw three Purple Sandpipers, secured one.

1886, April 21. A large flight of Scoters, notwithstanding the wind is north.

1886, April 22. A large flight; wind S. W., and a little foggy. The Scoters flew very high.

1886, April 23. Quite a movement, wind west in the morning and pleasant, then came S. E.

1886, April 24. An enormous flight, wind south and pleasant, Scoters flying high.

1886, April 25. A large flight, wind N. W., pleasant, Scoters all flying very high.

1886, April 27. A small movement going west—wind west, pleasant.

“ “ 28. A larger movement going west; wind south and pleasant; the migration drawing to a close.

1887, April 10-11. Quite a number of Scoters flying to the east—the first this spring. Weather very warm.

1887, April 16. A good many Scoters, wind S. E.

1887, April 15. Quite a number of Scoters in the afternoon, wind S. E., moderate. None in morning, wind S. W.

1887, April 20. Some Scoters flying to the west in the morning, and in the opposite direction in the afternoon; these were *not* migrating birds, but ‘traders’ Wind light north—S. W. in P.M.

1887, April 21. A flight in the afternoon; none in the morning, wind light N. in the morning, N. W. and S. E. in the afternoon; Scoters flew high.

1887, April 22. A good many Scoters flying wide off shore and high; wind light S. W.

1888, April 14. A great many Scoters flying to the eastward in the afternoon, wind S. W., raining; in the morning, wind N. W. cold but few birds flying.

1888, April 15. Some Scoters going east, wind north and cold.

1888, April 16. A flight to the eastward; wind S. W., warm. This is the *earliest* flight I have ever heard of.

1889, April 20. An *enormous* flight to the eastward, birds flying high in the morning with calm weather, and flying lower in the afternoon after it breezed up; wind S. W., warm.

1889, April 21. Another *large* flight of Scoters to the eastward; wind

S. W., light and warm. Shot a full plumaged male Wood Duck from a flock of Surf Scoters, only *one* seen.

1890, April 17. A flight, mostly White-wings, going east; wind S. W., light in the morning, and fresh in the afternoon.

1890, April 21. Many Scoters flying high, wind W. early, and S. W. light at 7 A.M. Birds going east.

Some years no large flight takes place in the spring, the birds passing nearly all the time in small numbers, owing probably to peculiarities of the weather; but such years are very unusual.

JUNCO CAROLINENSIS SHOWN TO BE A SUBSPECIES.

BY JONATHAN DWIGHT, JR.

WHEN Mr. William Brewster in 1886 described a new Junco from the mountains of western North Carolina he considered it a subspecies of *J. hyemalis* and called it *Junco hyemalis carolinensis* (Auk, II, 1886, p. 248).

In the Supplement to the A. O. U. Check-List for 1889, this bird was accorded full specific rank. The reason for this never appeared; presumably it was on the ground that until two forms are proved to intergrade they are to be considered distinct species; and further, because no birds had been taken in the region intervening between the Catskill Mountains and North Carolina.

During the latter part of June, 1890, I visited the mountains of Pennsylvania expressly with a view to determining what sort of Juncos, if any, were found there, and, as I expected, obtained a series that clearly shows *carolinensis* to be only one end of a series that, beginning with typical *J. hyemalis* to the north, and extending southward along the Appalachian Mountain System, reaches its maximum differentiation at the southern end of these mountains.

I have compared my birds with breeding specimens from Nova Scotia and Quebec on the one hand, and from North Carolina and Tennessee on the other. On an average they most re-